

Project Description

We are the software team from the University of Electronic Science and Technology of China. Combined with the characteristics of electronic information, we have an interest in the two aspects: biological computing and biological information storage. In the promising field of biology, we used our professional strengths to make a research and discuss the selection of project.

In the DNA information storage area, we understood that the existing software applications about DNA information storage were still very small, and had not reached the real utility yet. Some features such as low synthesis accuracy, slow speed, high cost and so on, make us want to improve and standardize the DNA information storage software. At present, there are a variety of algorithms about DNA information storage, we think of sorting out them to develop a DNA information storage platform -Bio101. It can realize the existing computer file coding and decoding, solve the problem of storage format standardization. Furthermore, we will try to complete random DNA information storage function.

In terms of biological computing, we mainly focus on the design of genetic transcription circuit based on living cell in biological computing. The research of gene regulatory network needs to study in living creatures, and the function of plasmid transcription is affected by various conditions in the experiment. Inspired by the cello software, we plan to achieve an interactive genetic transcription circuit design platform -Bio1024. It owns visual interface and produce genetic circuit sequence through drag the modular components. Users can set parameters of each component of the circuit. Eventually, software gives the function prediction of the circuit performance. This platform has strong practicability. It makes the abstract concept presented in the practical function.

Besides these designs, we developed a game software named Bio2048. It's an Android game based on the Gabriele Cirulli's 2048, a popular sliding block puzzle game. Instead of the numbers, the blocks are labeled with some common biological patterns, such as gene and protein. All the patterns form a biological ladder by their spatial scale. If two patterns with the same biological terms collide while moving, they will merge into a pattern with a new biological term which moves up by one on the biological ladder. This design aims to promote the biological knowledge among youngsters.